REMARKS

Applicants thank the Examiner for acknowledging Applicant's claim to foreign priority, and for indicating that the certified copy of the priority document, European Patent Application No. 99402497.4 dated October 12, 1999, has been made of record in the file.

Applicants thank the Examiner for initialing the references listed on the PTO-1449 form submitted with the Information Disclosure Statements filed on October 21, 1999 and April 25, 2000, thereby confirming that the listed references have been considered.

The Examiner has indicated that the Declaration is defective. Applicants are filing a Submission of Substitute Declaration and Power of Attorney concurrently with this Amendment.

Applicants herein amend the disclosure as suggested by the Examiner. No new matter has been added by the amendments to the disclosure.

Applicants are concurrently filing a Request for Approval of Proposed Drawing Corrections with this Amendment. The proposed drawing correction changes "Fig." to "Fig. 1" to conform to the amended disclosure.

Claims 1-10 have been examined on their merits.

Applicants herein amend claims 1-10 to remove reference callouts, remove awkward language and conform the claims to U.S. practice. The amendments to claims 1-10 were made merely to more accurately claim the present invention and do not narrow the literal scope of the claims as originally filed. The amendments to claims 1-10 do not add any new matter. The amendments to claims 1-10 were not made for reasons of patentability, as discussed below.

Applicants herein add new claims 11-16. The new claims 11-16 do not add any new matter.

Support for the new claims 11-16 can be found, for example, on page 10 of the disclosure. Entry and consideration of the new claims is respectfully requested.

Claims 1-16 are all the claims presently pending in the application.

1. Claims 3, 4 and 9 stand rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite.

Applicant has amended claims 3, 4 and 9 to remove the term "similar" from the claims. Applicants believe that the Examiner's rejection has been overcome, and request withdrawal of the § 112, second paragraph rejection.

2. Claims 1 and 7 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Cidon (U.S. Patent No. 5,309,433). Applicants respectfully traverse the rejection of claims 1-7, and insofar as the rejection applies to new claims 11-16, at least for the reasons set forth below.

To support a conclusion that a claimed invention lacks novelty under 35 U.S.C. § 102, a single source must teach all of the elements of a claim. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379 (Fed. Cir. 1986). A single source must disclose all of the claimed elements arranged as in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

Cidon solves a harmonization problem in a network where ANR addressing is used for unicast or single-destination connections and TMM addressing is used for multicast or multiple-destination connections. Cidon discloses, *inter alia*, resolving a harmonization problem by using

in the packet header of multicast packets an ANR address that identifies a unicast connection between the host or source of a multicast session and one node of the multicast tree. The packet header of the multicast packets in addition still contains the TMM address that is used to further route the packets from the one node of the multicast tree to all destinations of the multicast tree. The actual multicasting disclosed by Cidon still relies on a single TMM address, which means that Cidon still suffers from all drawbacks of a host-group multicast implementation: i) requirement to maintain the state for each multicast group; ii) large number of join and leave messages flooding the network, and iii) scalability. Lengthy packet headers are clearly not an issue in Cidon. Moreover, Cidon does not disclose any mechanism to compress the packet header in connectionless implementations of multicasting.

Contrary to the Examiner's assertion, Cidon fails to teach or suggest several aspects of the invention recited in claim 1. First of all, the Examiner's citation to col. 2, lines 25-32 of Cidon does not support the Examiner's argument that Cidon teaches or suggests detecting a common prefix in at least two separate destination addresses. In the cited passage, Cidon discloses that automatic network routing (ANR) labels and a tree multicast mode (TMM) tree label are concatenated into the routing field of a packet. There is no teaching of suggestion that the concatenated information in the routing field has been derived by a detection of a common prefix in at least two destination addresses, as recited in claim 1. As disclosed by Cidon, for a tree multicast, each adapter has the identical address. *See* col. 6, lines 45-48 of Cidon. Moreover, Figure 6 of Cidon shows a whole series of ANR labels concatenated to the TMM tree label. There is no teaching or suggestion in Cidon of somehow compressing the ANR labels if a common prefix was present. Instead, Cidon

simply discloses concatenating all the ANR labels together. *See* col. 7, lines 32-35 of Cidon. The Examiner has not identified any detailed teaching in Cidon of the detection and compression of common prefixes.

Second, Cidon lacks any teaching or suggestion of generating a suffix sequence, as recited in claim 1. Although the Examiner argues that Cidon allegedly discloses multicasting to several destination addresses, it is clear from Cidon that only one destination address receives the broadcast, i.e., the tree address stored by the adapter. *See* col. 6, lines 45-48 of Cidon. There is no teaching or suggestion of generating a suffix sequence composed of multiple destination addresses since Cidon only multicasts to what is in essence a single destination address. For example, if two different destination addresses were part of two different multicast trees, Cidon would require two different packets having routing labels composed of ANR labels and different TMM tree labels. In contrast, the present invention could send a packet to the two different destination addresses with a single packet due to the compound destination address.

Finally, Cidon fails to teach or suggest the addition of a common prefix to a generated series of suffixes. Again, in Figure 6 of Cidon, the plurality of ANR labels are simply concatenated to the TMM tree label. There is no disclosure that the TMM tree label is somehow equivalent to the generated series of suffixes, and there is no disclosure that the concatentated series of ANR labels is a common prefix, as recited in claim 1. Therefore, Applicants believe that the Examiner has not met the required showing of a single source teaching all of the elements of a claim, as required by *Hybritech* and *Richardson*.

Thus, Applicants believe that claim 1 is allowable over Cidon, and further believe that new

claims 11-13 are allowable as well, at least by virtue of their dependency from claim 1.

Independent claim 7 has recitations similar to claim 1, e.g., detection of common prefixes and suffix generation. Applicants believe that claim 7 is allowable at least for the same reasons as claim 1. Applicants further believe that new claims 14-16 are allowable as well, at least by virtue of their dependency from claim 7.

3. Claims 2, 4, 5, 6, 8 and 10 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Cidon in view of Johnson et al. (U.S. Patent No. 6,247,059). Applicants traverse the rejection of claims 2, 4, 5, 6, 8 and 10 at least for the reasons set forth below.

The initial burden of establishing that a claimed invention is *prima facie* obvious rests on the USPTO. *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). To make its *prima facie* case of obviousness, the USPTO must satisfy three requirements:

1. The prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated to artisan to modify a reference or to combine references. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988).
2. The proposed modification of the prior art must have had a reasonable expectation of success, and that determined from the vantage point of the artisan at the time the invention was made. *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1209 (Fed. Cir. 1991).
3. The prior art reference or combination of references must teach or suggest all the limitations of the claims. *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991); *In re Wilson*, 424 F.2d

1382, 1385 (CCPA 1970).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, the nature of a problem to be solved. *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999). Alternatively, the motivation may be implicit from the prior art as a whole, rather than expressly stated. *Id.* Regardless if the USPTO relies on an express or an implicit showing of motivation, the USPTO is obligated to provide particular findings related to its conclusion, and those findings must be clear and particular. *Id.* A broad conclusionary statement, standing alone without support, is not "evidence." *Id.; see also, In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001).

In addition, a rejection cannot be predicated on the mere identification of individual components of claimed limitations. *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000). Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *Id.*

Claims 2, 4, 5, 6, 8 and 10 depend from claim 1, and therefore include all the recitations of claim 1 by virtue of their dependency.

For claims 2, 5, 6, 8 and 10, the Examiner acknowledges that Cidon fails to disclose that the network system is connectionless. The Examiner attempts to overcome the deficiencies of Cidon by combining it with Johnson et al.

However, the combination of Cidon and Johnson et al. fails to teach or suggest the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and

suffixes together to form a compound destination address, as recited in claim 1 and included in claims 2, 5, 6, 8 and 10 via dependency. Applicants have discussed earlier why Cidon fails to render the present invention, and will not repeat those arguments here (*see above discussion with respect to claim 1*). Johnson et al. is cited only for its teaching of a connectionless network. Applicants note that the Examiner has not cited Johnson et al. for any teaching of the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and suffixes together to form a compound destination address, as recited in claim 1 and included in claims 2, 5, 6, 8 and 10 via dependency. Therefore, Applicants believe that the Examiner has not made out a *prima facie* case of obviousness, as required by *In re Vaeck*. Thus, Applicants believe that claims 2, 5, 6, 8 and 10 are allowable over the combination of Cidon and Johnson et al., at least by virtue of their dependency from claim 1.

For claim 4, the Examiner has rejected these claims over Cidon standing alone. Applicants have discussed earlier why Cidon fails to render the present invention, and will not repeat those arguments here (*see above discussion with respect to claim 1*). Johnson et al. is cited only for its teaching of a connectionless network. Applicants note that the Examiner has not cited Johnson et al. for any teaching of the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and suffixes together to form a compound destination address, as recited in claim 1 and included in claim 4 via dependency. Therefore, Applicants believe that the Examiner has not made out a *prima facie* case of obviousness for the combination of Cidon and Johnson et al. as required by *In re Vaeck*. Thus, Applicants believe that claim 4 is allowable over the combination of Cidon and Johnson et al., at least by virtue of their dependency from claim 1.

4. Claim 3 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Cidon in view of Alkhatib (U.S. Patent No. 6,430,623). Applicants traverse the rejection of claim 3 at least for the reasons set forth below.

Claim 3 depends from claim 1, and therefore includes all the recitations of claim 1 by virtue of its dependency.

The Examiner acknowledges that Cidon fails to teach or suggest the use of IP addresses. The Examiner attempts to overcome the deficiencies of Cidon by combining it with Alkhatib.

However, the combination of Cidon and Alkhatib fails to teach or suggest the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and suffixes together to form a compound destination address, as recited in claim 1 and included in claim 3 via dependency. Applicants have discussed earlier why Cidon fails to render the present invention, and will not repeat those arguments here (*see above discussion with respect to claim 1*). Alkhatib is cited only for its teaching of IP addresses. Applicants note that the Examiner has not cited Alkhatib for any teaching of the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and suffixes together to form a compound destination address, as recited in claim 1 and included in claim 3 via dependency. Therefore, Applicants believe that the Examiner has not made out a *prima facie* case of obviousness for the combination of Cidon and Alkhatib, as required by *In re Vaeck*. Thus, Applicants believe that claim 3 is allowable over the combination of Cidon and Alkhatib, at least by virtue of its dependency from claim 1.

5. Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cidon in view of Johnson et al. and in further view of Alkhatib. Applicants traverse the rejection of claim 9 at least for the reasons set forth below.

Claim 9 indirectly depends from claim 1, and therefore includes all the recitations of claim 1 by virtue of its dependency.

The Examiner acknowledges that the combination of Cidon and Johnson et al. fails to teach or suggest the use of routing tables. The Examiner attempts to overcome the deficiencies of the combination of Cidon and Johnson et al. by combining it with Alkhatib.

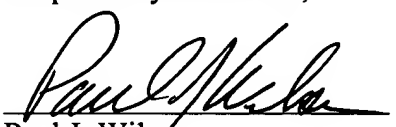
However, the combination of Cidon, Johnson et al. and Alkhatib fails to teach or suggest the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and suffixes together to form a compound destination address, as recited in claim 1 and included in claim 3 via dependency. Applicants have discussed earlier why Cidon fails to render the present invention, and will not repeat those arguments here (*see above discussion with respect to claim 1*). Johnson et al. is cited only for its teaching of a connectionless network. Applicants note that the Examiner has not cited Johnson et al. for any teaching of the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and suffixes together to form a compound destination address, as recited in claim 1 and included in claim 9 via dependency. Alkhatib is cited only for its teaching of routing tables. Applicants note that the Examiner has not cited Alkhatib for any teaching of the detection of common prefixes, the generation of suffixes and the addition of the common prefix(es) and suffixes together to form a compound destination address, as recited in claim 1 and included in claim 9 via dependency. Therefore, Applicants believe that the

Examiner has not made out a *prima facie* case of obviousness for the combination of Cidon and Alkhatib, as required by *In re Vaeck.* Thus, Applicants believe that claim 9 is allowable over the combination of Cidon and Alkhatib, at least by virtue of its dependency from claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Page 1, first full paragraph:

The present invention relates to a device for compressing a list of destination addresses of a multicast message [as defined in the non-characteristic part of claim 1], and a method for compressing a list of destination addresses of a multicast message [as defined in the non-characteristic part of claim 7], a router of a communications network wherein such a device for compressing is included [as defined in the non-characteristic part of claim 8], and a host of a communications network wherein such a device for compressing is included [as defined in the non-characteristic part of claim 10].

Page 3, second full paragraph:

According to the invention, this object is achieved by the device for compressing a list of destination addresses of a multicast message [according to claim 1], the method for compressing a list of destination addresses of a multicast message [according to claim 7], the router of a communications network [according to claim 8], and the host of a communications network [according to claim 10].

Page 4, delete the third and fifth full paragraphs.

Page 5, delete the first, third, fifth and seventh full paragraphs.

Page 6, first full paragraph:

The above mentioned and other objects and features of the invention will become more apparent and the invention itself will be best understood by referring to the following description of an embodiment taken in conjunction with the accompanying drawing Fig. 1 which is a scheme of an Internet INTERNET wherein the method for compressing a list of destination addresses of a multicast message according to the present invention is implemented.

Page 6, second full paragraph:

In [the figure] Fig. 1, four hosts, H1, D1, D2 and D3, and three routers, R1, R2 and R3, of the Internet INTERNET are drawn. Host H1 is connected to a port of the first router R1 via link L11. The ports R1P1 and R1P2 of the first router R1 are interconnected with ports of respectively the second router R2 and the third router R3 via respectively the link L12 and the link L13. Link L21 connects port R2P1 of the second router R2 to a port of the host D1. Similarly, link L22 connects port R2P2 of the second router R2 to a port of host D2 and link L33 interconnects port R3P1 of router R3 with a port of host D3. As is indicated on [the figure] Fig. 1, host D1 has address A.B.C.D, host D2 has address A.B.C.E and host D3 has address A.F.G.H. In these addresses, each letter is supposed to represent an octet so that each address consists of 32 bits (4 octets). Host H1 will play the role of sourcing host in the example described below so that its address does not need to be known in order to be able to illustrate the compression method according to the present invention. Host H1 and the three routers R1, R2 and R3 are supposed to incorporate a destination list compression device according to the present invention.

Paragraph bridging pages 6 and 7:

To explain the invented compression technique it is supposed that host H1 has to multicast an IP (Internet Protocol) datagram to the destination hosts D1, D2 and D3 and thereto applies connectionless multicasting. In the overhead section of this IP datagram, host H1 thus has to identify the destination hosts D1, D2 and D3 by their respective IP addresses A.B.C.D, A.B.C.E and A.F.G.H. The destination list compression device in host H1 will aid to realize [realise] this with low overhead consumption. The destination list compression device in host H1 detects that the addresses A.B.C.D and A.B.C.E of respectively host D1 and host D2 hove a common prefix A.B.C. By subtracting this common prefix A.B.C from the addresses A.B.C.D and A.B.C.E, the compression device obtains the suffixes D and E which it uses to generate a suffix list {D,E}. This suffix list {D,E} is added to the common prefix A.B.C to constitute a compound address A.B.C{D,E} that still indicates that the two hosts D1 and D2 belong to the destinations of the IP datagram but which contains only 5 octets, i.e., A, B, C, D and E, instead of the 8 octets, A, B, C, D, A, B, C and E, that have to be embedded in the IP datagram overhead if no compression is applied. As a result of the first iteration step in the compression method, host H1 obtains a list of destination addresses for the IP datagram to be multicasted that consists of the IP address A.F.G.H and the compound destination address A.B.C{D,E}. In a second iteration step, the compression device in host H1 detects that the IP address A.F.G.H and the compound address A.B.C{D,E} still have a common prefix A. By subtracting this common prefix A from the IP address A.F.G.H and the compound address A.B.C{D,E}, the compression device of host H1 generates the suffixes F.G.H and B.C{D,E} from which the list of suffixes {B.C{D,E},F.G.H} is constituted. This list of suffixes

{B.C{D,E},F.G.H} is added to the common prefix A to generate a new compound address A{B.C{D,E},F.G.H} that indicates that the IP datagram has to be multicasted to the destination hosts D1, D2 and D3, but which thereto occupies only 8 octets, i.e., A, B, C, D, E, F, G, H, instead of the 12 octets, A, B, C, D, A, B, C, E, A, F, G and H, that would have been embedded in the overhead section of the IP datagram if no compression was applied. In this way, the overhead for transferring the IP datagram over link L11 has been reduced significantly.

Page 9, second full paragraph:

Summarizing [Summarising], iterative application of the compression technique according to the present invention, allowed to reduce the overhead section that is indicative for the destination addresses of the multicasted IP datagram from 12 to 8 octets on link L11. On link L12 between router R1 and router R2, this overhead section could be reduced from 8 to 5 octets. It is clear that statistically the obtained reduction of overhead will be even more significant in case more destination hosts are member of the multicast session, and in case these destinations have longer common prefixes.

IN THE CLAIMS:

The claims are amended as follows:

1. (*Amended*) Device for compressing a list of destination addresses [(A.B.C.D, A.B.C.E, A.F.G.H)] of a multicast message comprising:

means to detect a common prefix [(A.B.C)] in at least two destination addresses [(A.B.C.D, A.B.C.E)] of said list,

[CHARACTERISED IN THAT said device for compressing further comprises] means to generate a sequence of suffixes [({D,E})] of said at least two destination addresses [(A.B.C.D, A.B.C.E)], and

means to [constitute a compound destination address (A.B.C{D,E}), adapted to] add said sequence of suffixes [({D,E})] to said common prefix [(A.B.C)] to thereby create a [constitute said] compound destination address [(A.B.C{D,E})].

2. (*Amended*) Device for compressing according to claim 1,

wherein [CHARACTERISED IN THAT] said list of destination addresses comprises [(A.B.C.D, A.B.C.E, A.F.G.H) consists of] Internet Protocol addresses.

3. (*Amended*) Device for compressing according to claim 1,

wherein [CHARACTERISED IN THAT] said list of destination addresses comprises [consists of] Internet Protocol addresses and other compound destination [compound] addresses [similar to said compound destination address].

4. (*Amended*) Device for compressing according to claim 1,

wherein [CHARACTERISED IN THAT] said list of destination addresses comprises other [consists of] compound destination addresses [similar to said compound destination address].

5. (*Twice Amended*) Device for compressing according to claim 1,

wherein [CHARACTERIZED IN THAT] said device is incorporated in a host [(H1)] of a communications network [(INTERNET)] having connectionless multicast transmission capabilities.

6. (*Twice Amended*) Device for compressing according to claim 1,

wherein [CHARACTERIZED IN THAT] said device is incorporated in a router [(R1, R2, R3)] of a communications network [(INTERNET)] having connectionless multicast forwarding capabilities.

7. (*Amended*) Method for compressing a list of destination addresses [(A.B.C.D, A.B.C.E, A.F.G.H)] of a multicast message, said method comprises: [whereby]

detecting a common prefix [(A.B.C) is detected] in at least two destination addresses [(A.B.C.D, A.B.C.E)] of said list,

generating [CHARACTERISED IN THAT further] a sequence of suffixes [({D,E}) is generated] of said at least two destination addresses, [(A.B.C.D, A.B.C.E)] and

[a compound destination address (A.B.C{D,E}) is constituted by] adding said sequence of suffixes [({D,E})] to said common prefix [(A.B.C)] to create a compound destination address.

8. (*Amended*) Router [(R1, R2, R3)] of a communications network [(INTERNET)] having connectionless multicast forwarding capabilities,

wherein [CHARACTERISED IN THAT] said router [(R1, R2, R3)] incorporates a device for compressing a list of destination addresses [(A.B.C.D, A.B.C.E, A.F.G.H)] of a multicast message as defined by claim 1.

9. (*Amended*) Router [(R1, R2, R3, R4)] according to claim 8,

wherein [CHARACTERISED IN THAT] said router [(R1, R2, R3)] further comprises:

[incorporates] a routing table memory, and

means to address said routing table memory via a compound address having the same format as [similar to] said compound destination address.

10. (*Amended*) Host [(H1)] of a communications network [(INTERNET)] having connectionless multicast transmission capabilities,

wherein [CHARACTERISED IN THAT] said host [(H1)] incorporates a device for compressing a list of destination addresses [(A.B.C.D, A.B.C.E, A.F.G.H)] of a multicast message as defined by claim 1.

Claims 11-16 are added as new claims.